PIONEER®
*The Art of Entertainment*

# Service Manual

## STEREO POWER AMPLIFIER

# M-980

**● Refer to the service manual RRV1262 for M-980/KU.**

**THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).**

| Type | Model | Power Requirement | Remarks |
|---|---|---|---|
| | M-980 | | |
| KUXJ | O | AC120V | |
| KCXJ | O | AC120V | |

**● This product is a system(s) component.**
**This product does not function properly when independent; to avoid malfunctions, be sure to connect it to the prescribed system component(s), otherwise damage may result.**

**PIONEER ELECTRONIC CORPORATION** 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
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# ● CONTRAST OF MISCELLANEOUS PARTS

*NOTES:*

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

M-980/KUXJ,M-980/KCXJ and M-980/KU have the same construction except for the following:

| Mark | Symbol & Description | Part No. | | | Remarks |
|---|---|---|---|---|---|
| | | M-980/KU | M-980/KUXJ | M-980/KCXJ | |
| | Side pad No.1 | AHA7025 | Not used | Not used | |
| | Side pad No.2 | AHA7026 | Not used | Not used | |
| | Front pad | Not used | AHA1665 | AHA1665 | For Packing |
| | Rear pad | Not used | AHA1666 | AHA1666 | For Packing |
| | Packing case | AHD7154 | RHG1702 | RHG1702 | |
| | Operating instractions (French) | Not used | Not used | ARC7060 | |
| NSP | Chassis | ANA1491 | RNE1874 | RNE1874 | |
| | Rear panel | ANC7208 | RNA2020 | RNA2020 | |
| NSP | PCB mould | AMR1525 | Not used | Not used | |
| | PCB mould | Not used | AMR2533 | AMR2533 | |
| | Binder | AEC−093 | Not used | Not used | |
| NSP | Binder | Not used | ZCA−BK1 | ZCA−BK1 | |
| | Power amp module | AXQ7022 | AXQ7122 | AXQ7122 | |
| | AC power cord | ADG1146 | PDG1015 | PDG1015 | |
| | Speaker button | AAD4071 | AAD2416 | AAD2416 | |
| | 65 label | ORW1069 | ORW1069 | Not used | |

## POWER AMP MODULE

AXQ7122 and AXQ7022 have the same construction except for the following:

| Mark | Symbol & Description | Part No. | | Remarks |
|---|---|---|---|---|
| | | AXQ7022 | AXQ7122 | |
| | Heat sink | ANH7007 | ANH7008 | |
| | Bracket | ANG1868 | ANG7009 | |
| | Mold A | AMR2594 | AMR7005 | |
| | Mold B | AMR2595 | AMR7006 | |

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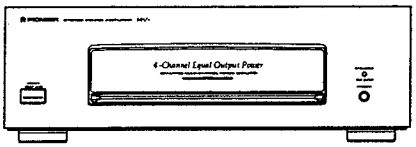

## STEREO POWER AMPLIFIER

# M-980

**THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).**

| Type | Model | Power Requirement | Remarks |
|---|---|---|---|
| | M-980 | | |
| KU | ○ | AC120V | |
| KC | ○ | AC120V | |

- **This product is a system(s) component.**
  **This product does not function properly when independent; to avoid malfunctions, be sure to connect it to the prescribed system component(s), otherwise damage may result.**

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# 1. SAFETY INFORMATION

**This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.**
**Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.**

WARNING
**Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).**
**When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.**

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

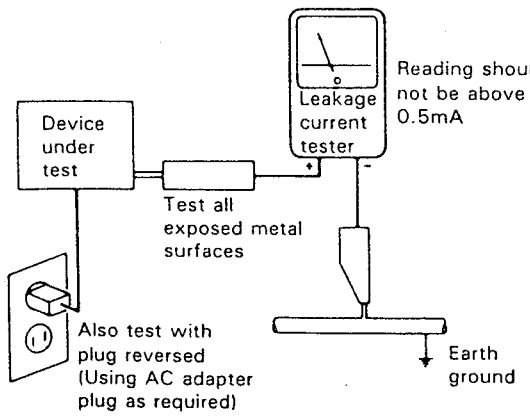
(FOR USA MODEL ONLY)

## 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

### LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Leakage current tester
Reading should not be above 0.5mA
Device under test
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

## 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

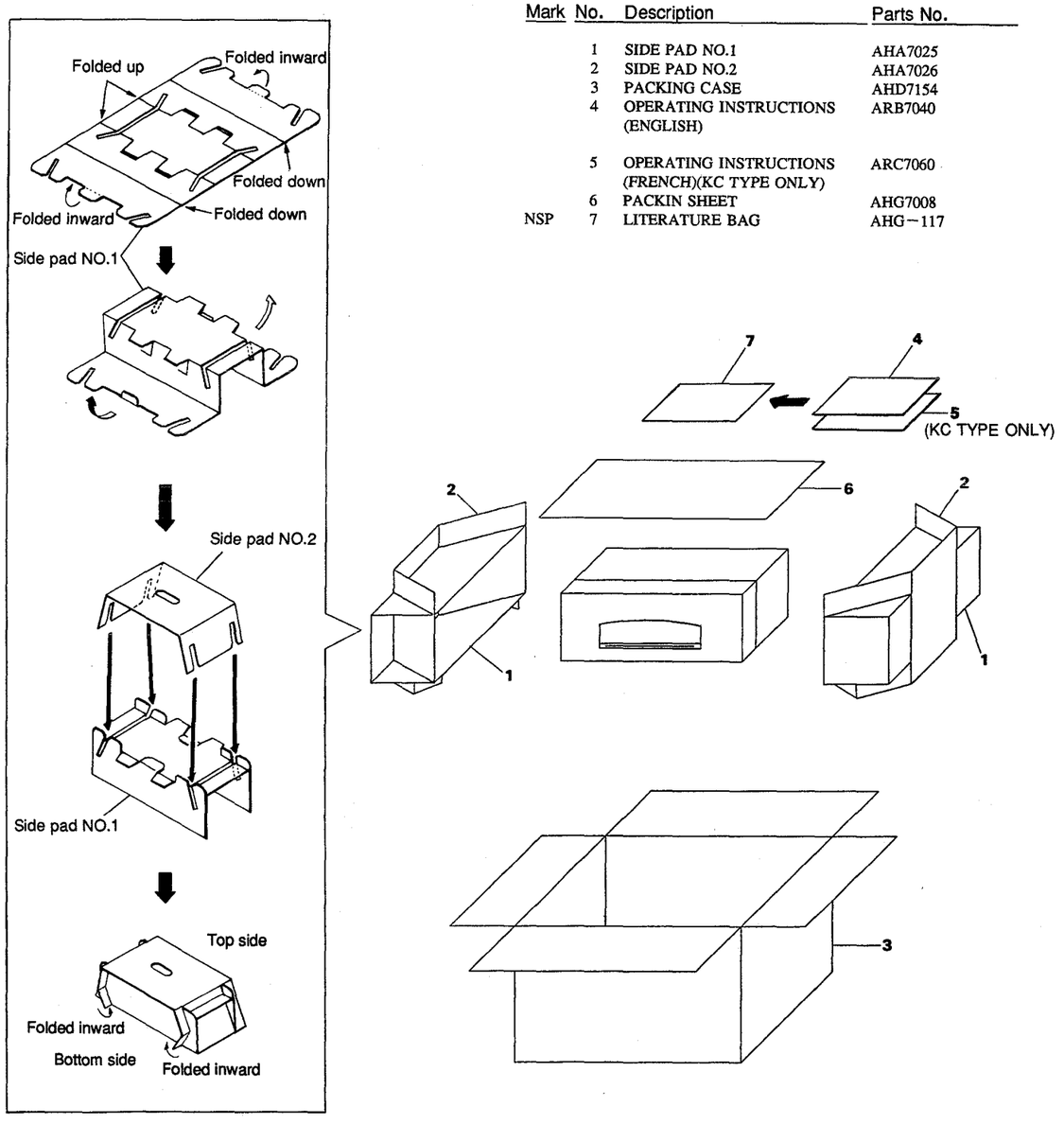
Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

# 2. EXPLODED VIEWS, PACKING AND PARTS LIST

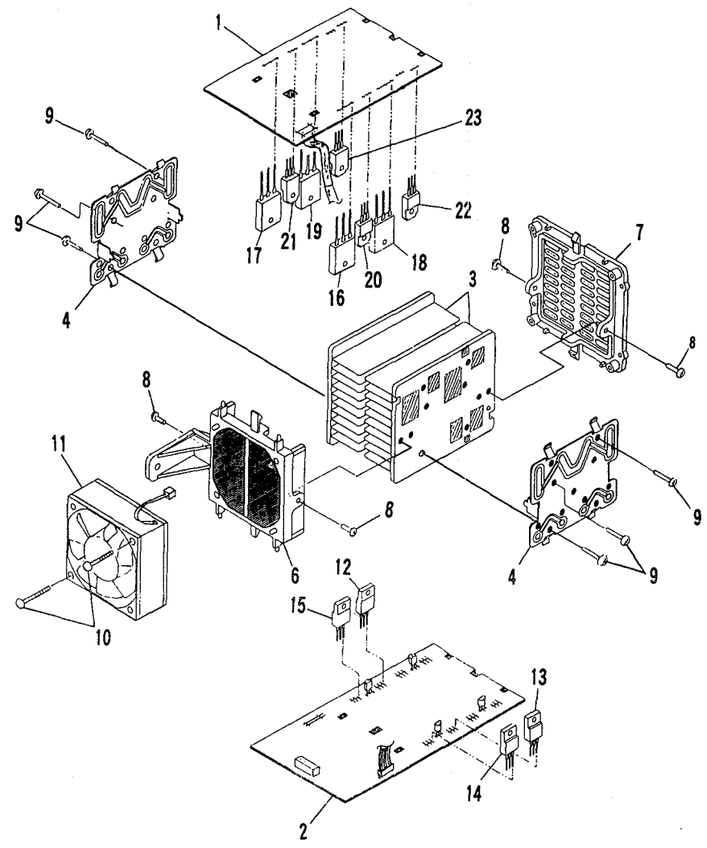
*NOTES:*
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

## 2.1 PACKING




| Mark | No. | Description | Parts No. |
|---|---|---|---|
| | 1 | SIDE PAD NO.1 | AHA7025 |
| | 2 | SIDE PAD NO.2 | AHA7026 |
| | 3 | PACKING CASE | AHD7154 |
| | 4 | OPERATING INSTRUCTIONS (ENGLISH) | ARB7040 |
| | 5 | OPERATING INSTRUCTIONS (FRENCH)(KC TYPE ONLY) | ARC7060 |
| | 6 | PACKIN SHEET | AHG7008 |
| NSP | 7 | LITERATURE BAG | AHG−117 |

## 2.2 POWER AMP MODULE

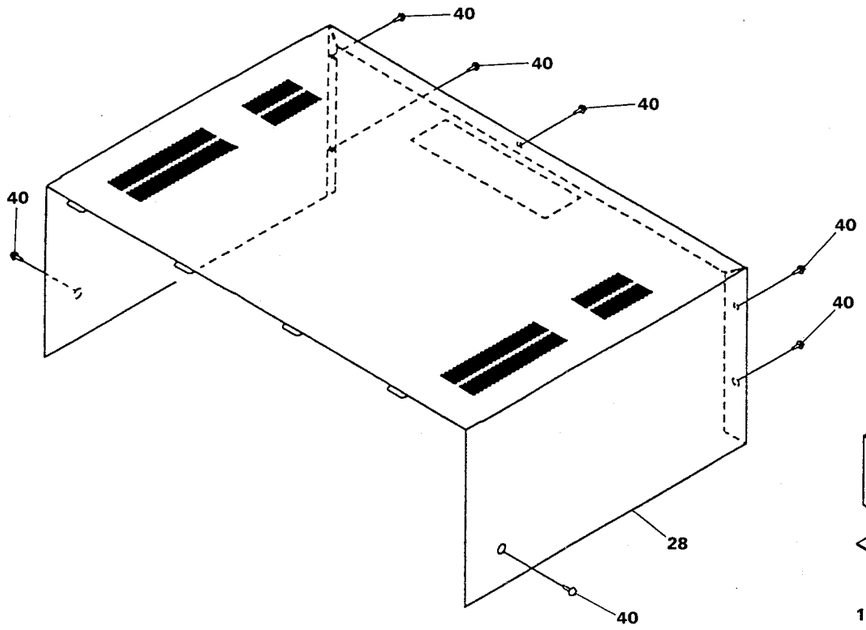


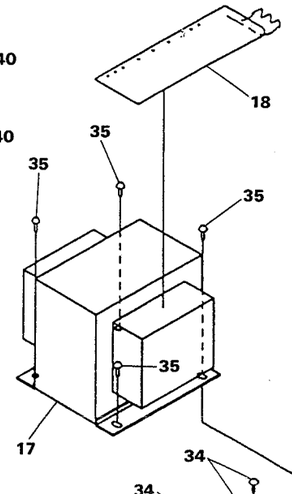

*Note: Ensure that silicon grease does not adhere to the MOLD A (No. 6) and MOLD B (No. 7).*

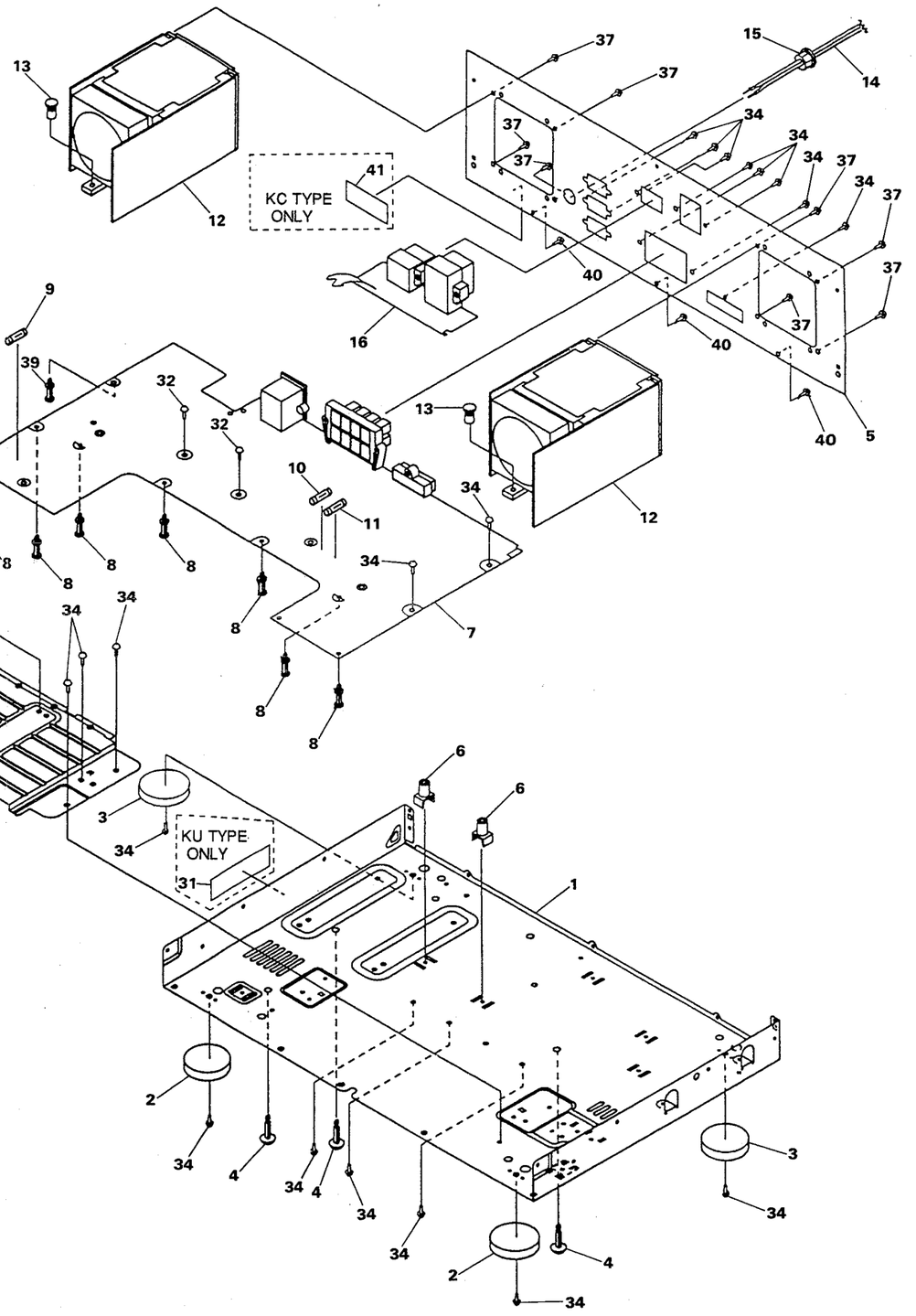
### Parts List of Power Amp Module

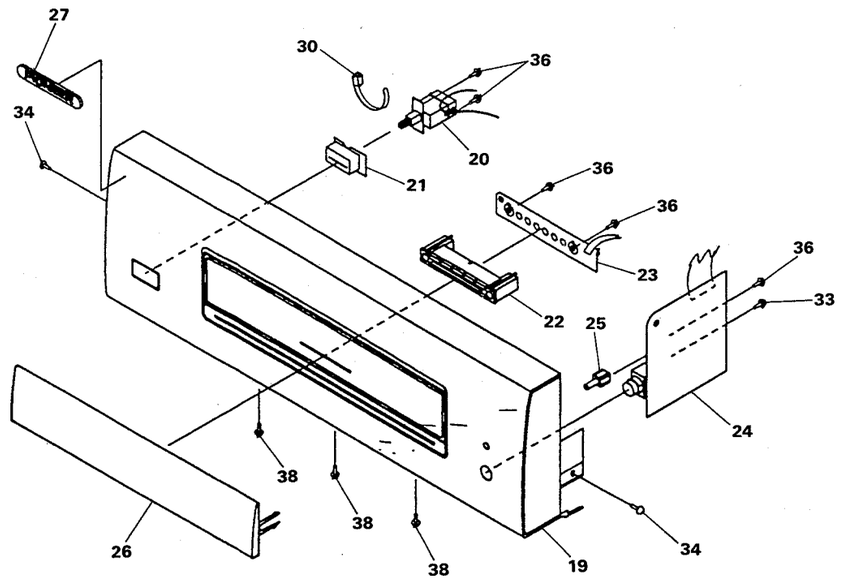
| Mark | No. | Description | Parts No. |
|---|---|---|---|
| | 1 | FRONT 100W ASSY | AWZ7725 |
| | 2 | REGULATOR ASSY | AWZ7726 |
| | 3 | HEAT SINK (AL) | ANH7007 |
| | 4 | BRACKET | ANG1868 |
| | 5 | ..... | |
| | 6 | MOLD A | AMR2594 |
| | 7 | MOLD B | AMR2595 |
| | 8 | SCREW (3×10) | ABA1021 |
| | 9 | SCREW | BBZ30P140FZK |
| | 10 | SCREW | BPZ30P350FZK |
| | 11 | FAN MOTOR | AXM7003 |
| | 12 | REGULATOR IC (IC7401) | NJM7812FAS |
| | 13 | REGULATOR IC (IC7402) | NJM7912FA |
| | 14 | REGULATOR IC (IC7403) | NJM7812FAS |
| | 15 | REGULATOR IC (IC7404) | NJM7805FAS |
| ⚠ | 16 | TRANSISTOR (Q7511) | 2SA1264N |
| ⚠ | 17 | TRANSISTOR (Q7512) | 2SA1264N |
| ⚠ | 18 | TRANSISTOR (Q7513) | 2SC3181N |
| ⚠ | 19 | TRANSISTOR (Q7514) | 2SC3181N |
| ⚠ | 20 | TRANSISTOR (Q7503) | 2SC4793 |
| | 21 | TRANSISTOR (Q7504) | 2SC4793 |
| | 22 | TRANSISTOR (Q7509) | 2SA1837 |
| | 23 | TRANSISTOR (Q7510) | 2SA1837 |

## 2.3 EXTERIOR




**NOTE : Screws adjacent to ▼ mark on product are used for disassembly.**

● This diagram is viewed from the mounted parts side.

SP TERMINAL ASSY

SP TERMINAL ASS'Y
AWZ7587

AF ASSY

AC IN

NEUTRAL LIVE

PRIMARY

SECONDARY

AF ASS'Y
AWZ7584

TRANS ASSY

T1
⚠ POWER TRANSFORMER

TO
REGULATOR
ASSY
CN7101

TO
FRONT
100W ASSY
CN7502

TRANS ASS'Y
AWZ7585

ATTENTION
POUR LES PRECAUTIONS
CONTINUELLES CONTRE L'INCENDIE,
LES FUSIBLES A REMPLACER
DOIVENT ETRE LES MEMES TYPE MEMES
TYPES VALEURS NOMINALS UNIQUEMENT.

CAUTION
FOR CONTINUED
PROTECTION AGAINST
FIRE HAZARD,
REPLACEMENT FUSES
SHOULD BE OF
THE SAME TYPE AND
RATINGS ONLY.

FU101

FU111

FU112

S101

K1

K2

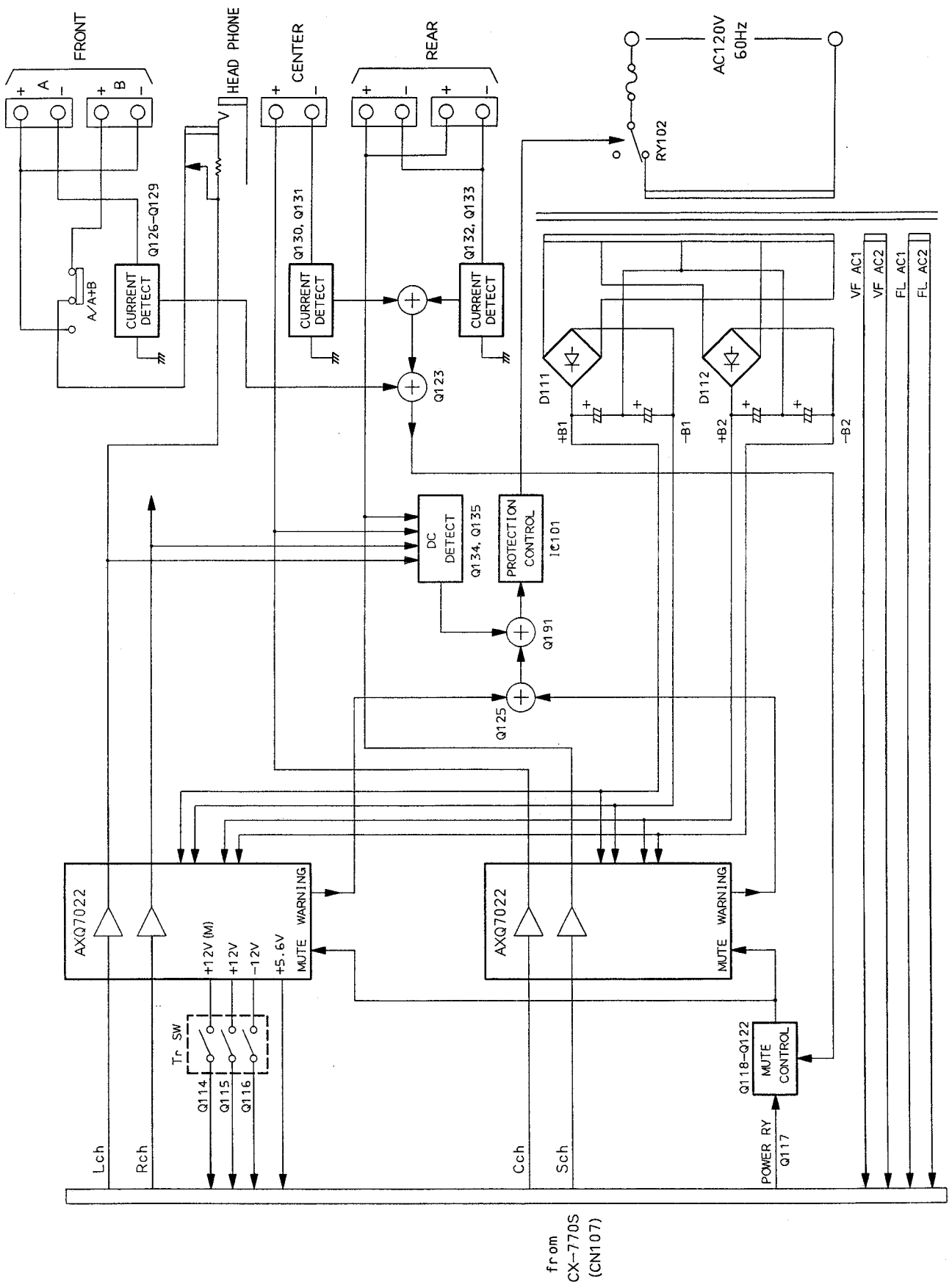
TO
FRONT 100W
ASSY CN75

TO
REGULATOR
ASSY
CN7101

IC101 Q130 Q131 Q132 Q133 Q118 Q122 Q119-Q121 Q126-Q129 Q117
Q123 Q135 Q125 Q191
Q134

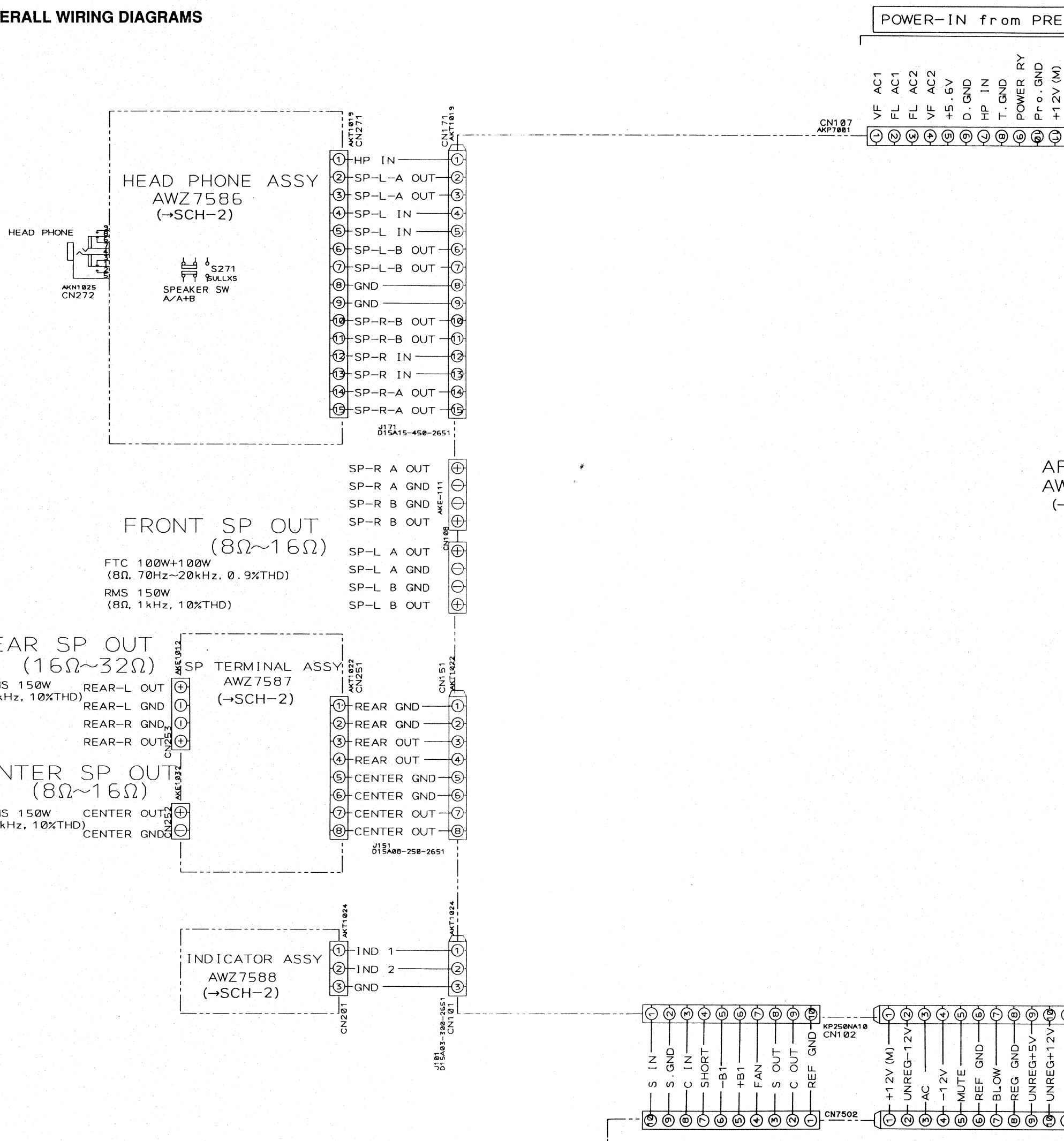
| Mark | No. | Description | Parts No. |
|---|---|---|---|
| NSP | 1 | CHASSIS | ANA1491 |
| | 2 | INSULATOR (ABS) | PNW1912 |
| | 3 | INSULATOR ASSY | DXA1490 |
| NSP | 4 | PCB HOLDER | AEC1583 |
| | 5 | REAR PANEL | ANC7208 |
| NSP | 6 | PCB MOLD | AMR1525 |
| | 7 | AF ASSY | AWZ7584 |
| | 8 | PCB SUPPORT | AEC1581 |
| ⚠ | 9 | FUSE (FU101, 8A) | AEK1002 |
| ⚠ | 10 | FUSE (FU111, 4A) | AEK1018 |
| ⚠ | 11 | FUSE (FU112, 4A) | AEK1018 |
| | 12 | POWER AMP MODULE | AXQ7022 |
| | 13 | PUSH RIVET | AEC7010 |
| ⚠ | 14 | AC POWER CORD | ADG1146 |
| | 15 | STRAIN RELIEF | AEP−113 |
| NSP | 16 | SP TERMINAL ASSY | AWZ7587 |
| ⚠ | 17 | POEWR TRANSFORMER (T1) | ATS7047 |
| NSP | 18 | TRANS ASSY | AWZ7585 |
| | 19 | FRONT PANEL | AMB7203 |
| ⚠ | 20 | PUSH SWITCH (S101) | ASG−553 |
| | 21 | POWER BUTTON | AAD7064 |
| | 22 | INDI. LENS | AAK7075 |
| NSP | 23 | INDICATOR ASSY | AWZ7588 |
| NSP | 24 | HEAD PHONE ASSY | AWZ7586 |
| | 25 | SPEAKER BUTTON | AAD4071 |
| | 26 | ILLUMI. PANEL | AAK7146 |
| | 27 | NAME PLATE | PAM1608 |
| | 28 | BONNET CASE | ANE7054 |
| | 29 | TRANS FRAME | ANA7019 |
| | 30 | BINDER | AEC−093 |
| | 31 | 65 LABEL (KU TYPE ONLY) | ORW1069 |
| | 32 | SCREW | ABA1018 |
| | 33 | SCREW | ABA1095 |
| | 34 | SCREW | BBZ30P080FZK |
| | 35 | SCREW | BBZ40P080FZK |
| | 36 | SCREW | BPZ26P080FMC |
| | 37 | SCREW | VPZ30P080FZK |
| | 38 | SCREW | ABA7005 |
| | 39 | PCB SPACER | AEC7021 |
| | 40 | SCREW | BBT30P080FZK |
| NSP | 41 | CSA LABEL (KC TYPE ONLY) | ARW−090 |

# 3. BLOCK DIAGRAM



# 4. SCHEMATIC AND PCB CONNECTION DIAGRAMS

## 4.1 OVERALL WIRING DIAGRAMS




**SCH-1** OVERALL WIRING DIAGRAMS

om PRE-OUT TO CX-770S

T.GND
POWER RY
Pro.GND
+12V (M)
+12V
REAR OUT
S.GND
CENTER OUT
-12V
R OUT
F.GND
L OUT

SCH-1

AC OUTLETS
AC120V 60Hz
UNAWICHED
TOTAL 200W MAX1.6A
SWICHED
100W MAX0.8A

AF ASSY
AWZ7584
(→SCH-2)

● NOTE FOR FUSE REPLACEMENT

CAUTION- FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.

FU111 AEK1018 (125V, 4A)
FU112 AEK1018 (125V, 4A)

AKT1019 CN106
CN186 AKT1019
J106 D15A15-150-2651
B1 AC1
B1 AC2
COM
B2 AC1
COM
B2 AC2
COM
VF AC1
VF AC2
FL AC1
FL AC2
TRANS ASSY AWZ7585 (→SCH-2)
ATS7047 T1 POWER TRANSFORMER

AKT1011 CN103
J103 D15A13-125-2651
REG GND
UNREG+5V
UNREG+12V
+5.6V
+12V
WARNING
CN7101

KP250NA10 CN104
R IN
F.GND
L IN
SHORT
-B1
+B1
FAN
R OUT
L OUT
REF GND
CN7502

CN105 AKT1011
J105 D15A13-125-2651
+12V (M)
UNREG-12V
AC
-12V
MUTE
REF GND
BLOW
REG GND
UNREG+5V
UNREG+12V
+5.6V
+12V
WARNING
CN7101

SCH-3)
SCH-4)

POWER MODULE
FRONT
AXQ7022

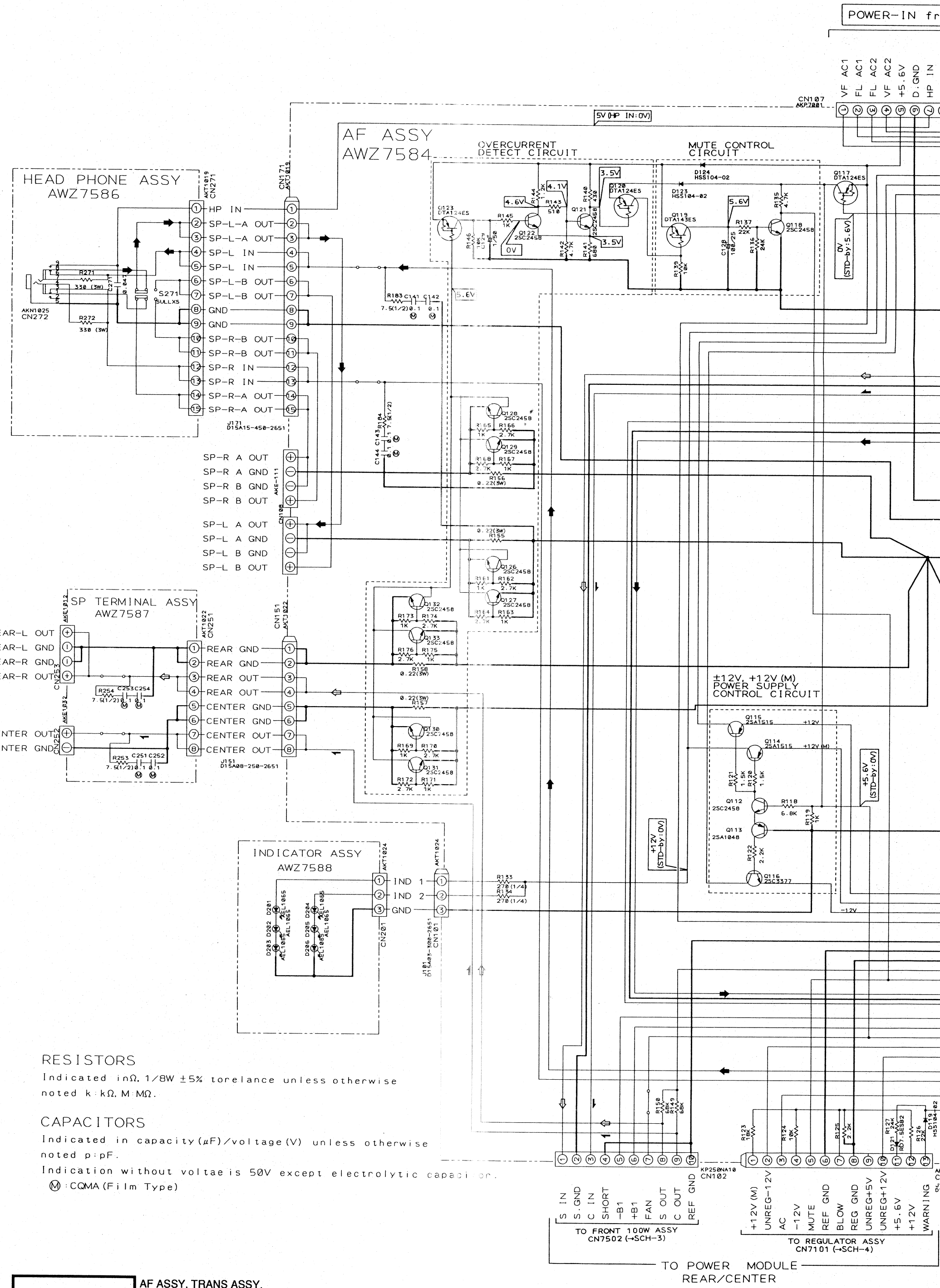
FRONT 100W ASSY : AWZ7725 (→SCH-3)
REGULATOR ASSY : AWZ7726 (→SCH-4)

## NOTE FOR SCHEMATIC DIAGRAMS (Type 1A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or µF unless otherwise noted.
   Ratings: capacitor (µF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or µH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   [V] : Signal voltage at rated output.
   or ← V :
   DC voltage (V) at no input signal unless otherwise noted.
   Value in ( ) is DC voltage at rated power.
   ⇦ mA or ← mA :
   DC current at no input signal unless otherwise noted.
7. **OTHERS:**
   - ⊘ or ❷ : Adjusting point.
   - : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SCH-□ ON THE SCHEMATIC DIAGRAM:**
   - SCH-□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):
   HEAD PHONE ASSY
   S271 : SPEAKERS (A / A+B)

OVERALL WIRING DIAGRAMS **SCH-1**

## 4.2 AF, TRANS, HEAD PHONE, SP TERMINAL AND INDICATOR ASSEMBLIES




### RESISTORS

Indicated in Ω, 1/8W ±5% torelance unless otherwise noted k : kΩ, M : MΩ.

### CAPACITORS

Indicated in capacity (μF) / voltage (V) unless otherwise noted p : pF.

Indication without voltae is 50V except electrolytic capaci or.

Ⓜ : CQMA (Film Type)

**SCH-2** AF ASSY, TRANS ASSY, HEAD PHONE ASSY, SP TERMINAL ASSY, INDICATOR ASSY

N from PRE-OUT TO CX-770S

SIGNAL ROUTE
➡ : AUDIO SIGNAL ROUTE (FRONT Lch)
⇨ : AUDIO SIGNAL ROUTE (REAR)
→ : AUDIO SIGNAL ROUTE (CENTER)

SCH-2

D.GND HP IN T.GND POWER RY Pro.GND +12V (M) +12V REAR OUT S.GND CENTER OUT -12V R OUT F.GND L OUT

PROTECTION CIRCUIT
ASG-553 S101
K2 K1
LED
TLP560G IC101
RY102 ASR7005
ACG1054 C101 0.01/AC400V
R102 100 (1/4)
C105 0.01/AC400V
R101 ACN-208 2.2M 1/2W
FU101 AEK1002
C102 ACG1054 0.01/AC400V
Y2003 ADX7043
Y2004 ADX7044
KN103
ARP1053
CN105
KN102 LIVE
KN101 NEUTRAL
⚠ AC POWER CORD AC120V 60Hz ADG1146
P101
P102
RELAY for AC OUTLET CONTROL
RY101 C104 0.01/AC400V ACG1054
ASR1027
Y2005 ADX7018
AKT1019 CN106
CN1186 AKT1019
B1 AC1
B1 AC2
COM
B2 AC1
COM
B2 AC2
COM
VF AC1
VF AC2
FL AC1
FL AC2
J106 D15A15-150-2651
TRANS ASSY AWZ7585
⚠ ATS7047 T1 POWER TRANSFORMER

+57V D111 LN6SB60-4003 C115 C116 C113 C114 C111 0.01/250
ACH1249 4700/71 C121
C113-C116 0.022/250
ACH1249 4700/71 C122
-57V
+23V D112 D2SBA20(B) FU111 AEK1018 FU112 AEK1018 C112 0.01/250
C123 2200/35
C124 470/35
-23V
AC DETECT CIRCUIT
R111 1.5K(3W) R112 1.5K(3W)
HSS104-02 D114 D113 D116 D115
AC15V AC9V

● NOTE FOR FUSE REPLACEMENT

CAUTION - FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.

+38V LED Q191 2SA965 R195 470 R193 680 C191 4.7/50 D191 RD12ESB3 R194 47K R192 27K R191 47K
R114 6.8K C126 10/50 R113 6.8K C125 10/50
Q135 2SC1845 Q134 2SC1845 R151 6K C131 220/10
9.6V 9.6V
Q125 2SC1845 R117 22K C130 4.7/50
0V
-12V
+5.6V
+12V
R148 68K R147 68K R146 68K
D122 RD7.5ES82 R132 24K
D120 HSS104-02
R128 18K R129 10K R130 2.2K R131 22K
D119 HSS104-02 R126 22K

AKT1011 CN103 J103 D15A13-125-2651
KP250NA10 CN104
CN105 AKT1011 J105 D15A13-125-2651

R IN F.GND L IN SHORT -B1 +B1 FAN R OUT L OUT REF GND
TO FRONT 100W ASSY CN7502 (→SCH-3)

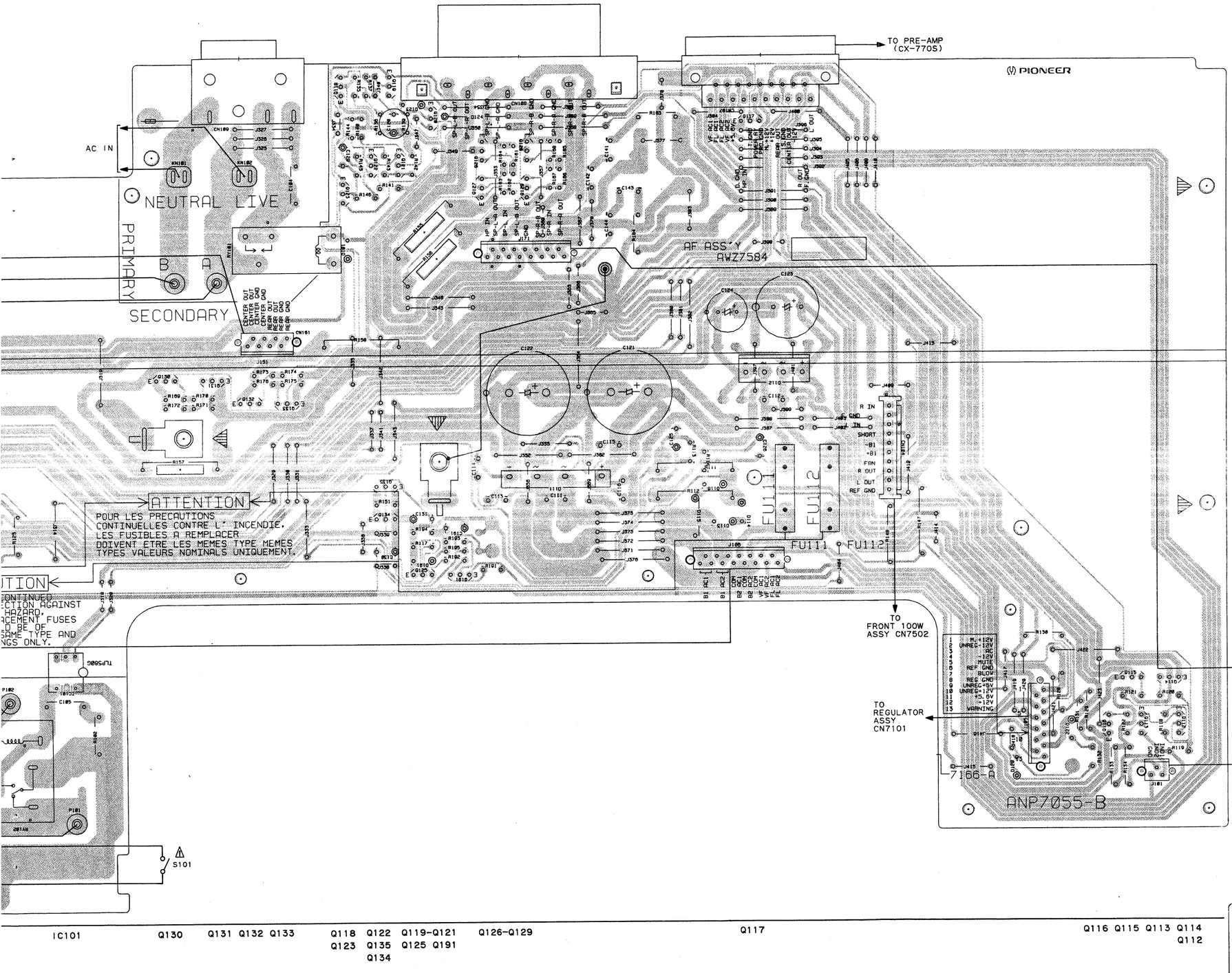
+12V (M) UNREG-12V AC -12V MUTE REF GND BLOW REG GND UNREG+5V UNREG+12V +5.6V +12V WARNING
TO REGULATOR ASSY CN7101 (→SCH-4)

TO POWER MODULE FRONT

AF ASSY, TRANS ASSY, HEAD PHONE ASSY, SP TERMINAL ASSY, INDICATOR ASSY

**SCH-2**

● This diagram is viewed from the mounted parts side.



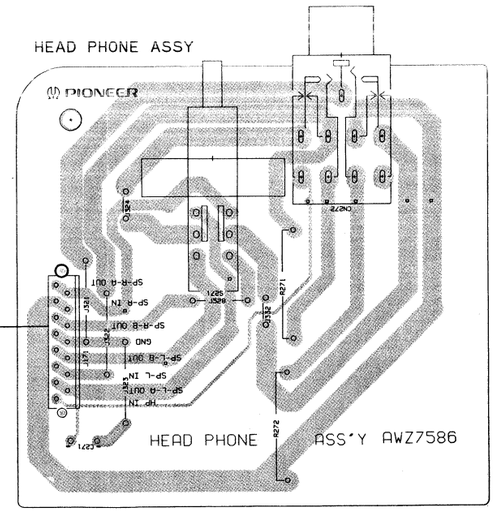

NOTE FOR PCB DIAGRAMS:

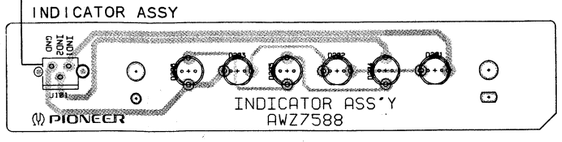
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

| Symbol in PCB Diagrams | Symbol in Schematic Diagrams | Part Name |
|---|---|---|
| Q504 E C B Q504 | Q504 Q504 | Transistor |
| D203 D203 | D203 | Diode |
| C513 C513 | C513 | Capacitor (Polarized) |

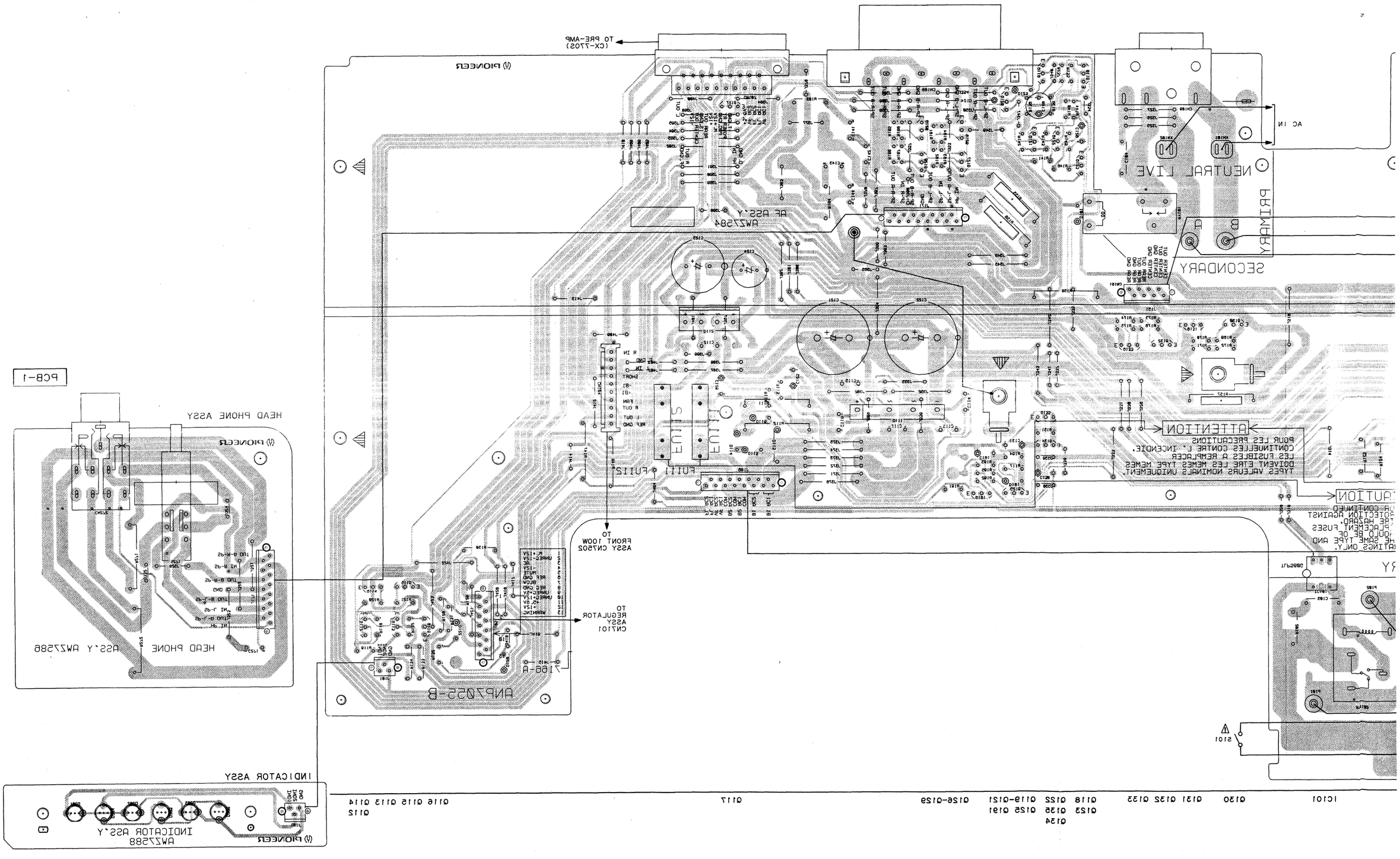
3. The transistor terminal marked with E or ⊏ shows the emitter.
4. The diode terminal marked with ◎ or ⊂ shows cathode side.
5. The capacitor terminal marked with ◎ or ⊏ shows negative terminal.

PCB-1

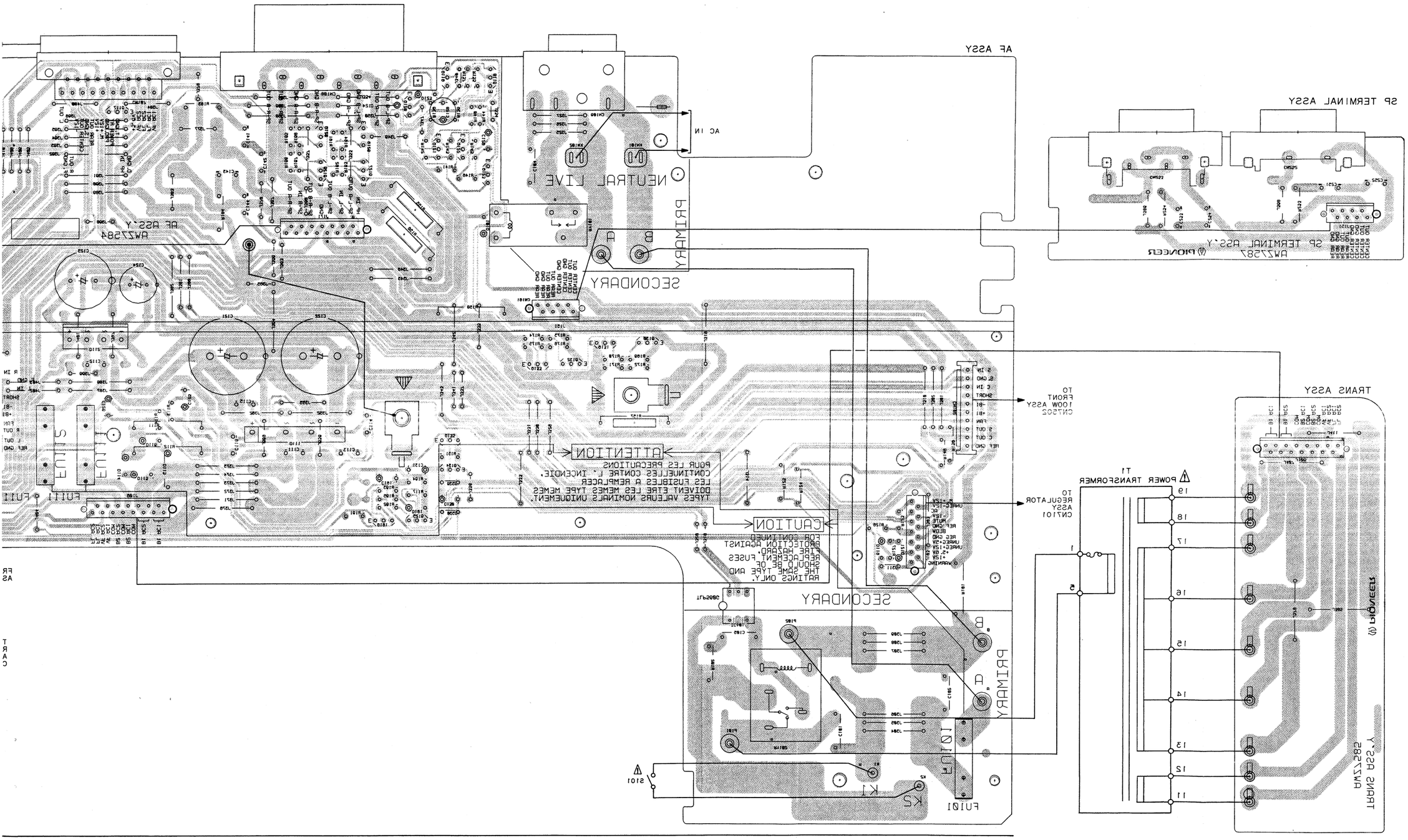


● This diagram is viewed from the foil side.



● This diagram is viewed from the foil side.


AF ASSY
SP TERMINAL ASSY
AC IN
NEUTRAL LIVE
PRIMARY
SECONDARY
CAUTION
FOR CONTINUED
PROTECTION AGAINST
FIRE HAZARD,
REPLACEMENT FUSES
SHOULD BE OF
THE SAME TYPE AND
RATINGS ONLY.
ATTENTION
POUR LES PRECAUTIONS
CONTINUELLES CONTRE L' INCENDIE,
LES FUSIBLES A REMPLACER
DOIVENT ETRE LES MEMES TYPE MEMES
TYPES VALEURS NOMINALS UNIQUEMENT.
TO
FRONT
LOW ASSY
CN702
TO
REGULATOR
ASSY
CN701
POWER TRANSFORMER
T1
TRANS ASSY
AWZ282
AF ASSY
AWZ284
SP TERMINAL ASSY
AWZ287
PIONEER
FUSE
FUSE
FUSE

## 4.3 FRONT 100W ASSEMBLY

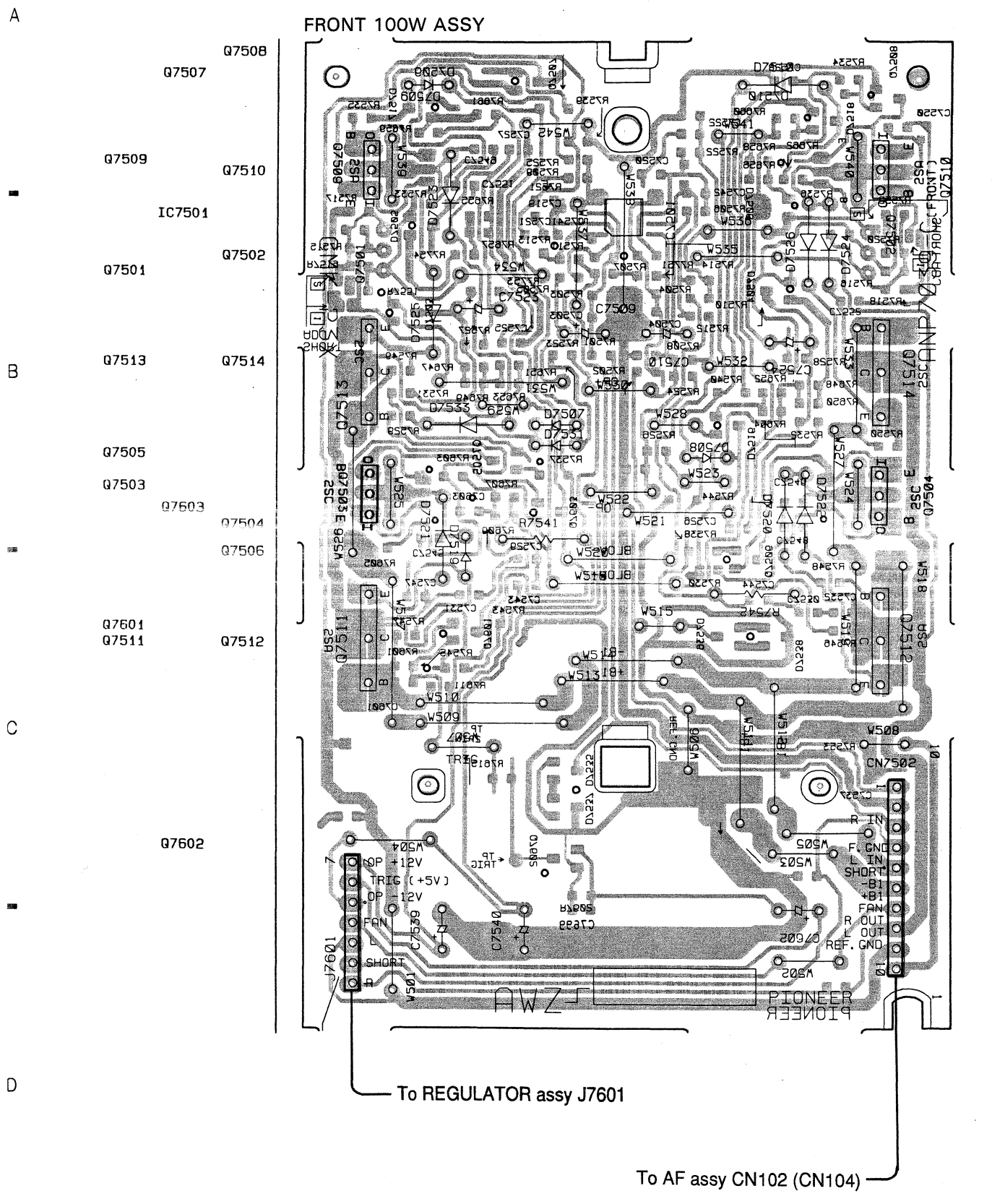
● This diagram is viewed from the foil side.

PCB-2

## 4.3 FRONT 100W ASSEMBLY

- This diagram is viewed from the mounted parts side.

**PCB-2**



SCH-3

# FRONT 100W assy (AWZ7725)

SIGNAL ROUTE
➡ : AUDIO SIGNAL ROUTE

To AF assy CN102 (CN104) (➡ SCH-2)

To REGULATOR assy J7601 (➡ SCH-4)

CN7502
KPD10L (KM250NA10L)

J7601

Q7503, Q7504, Q7509, Q7510 : POWER TRANSISTOR

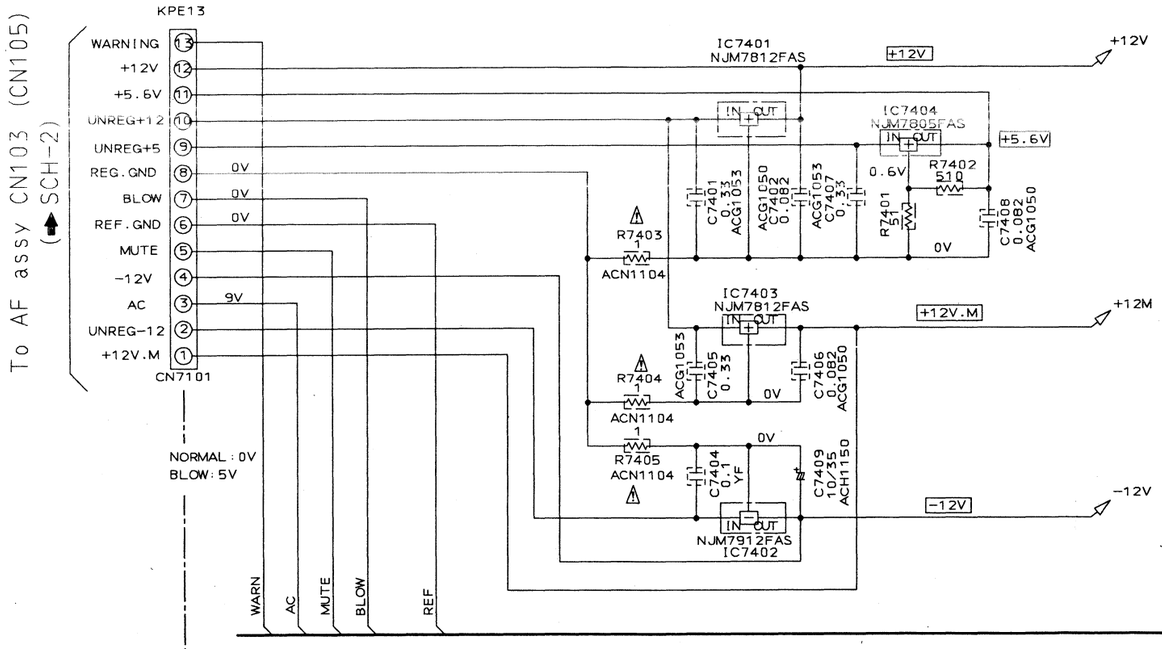
IC7501 (1/2) UPC4570G2(5)

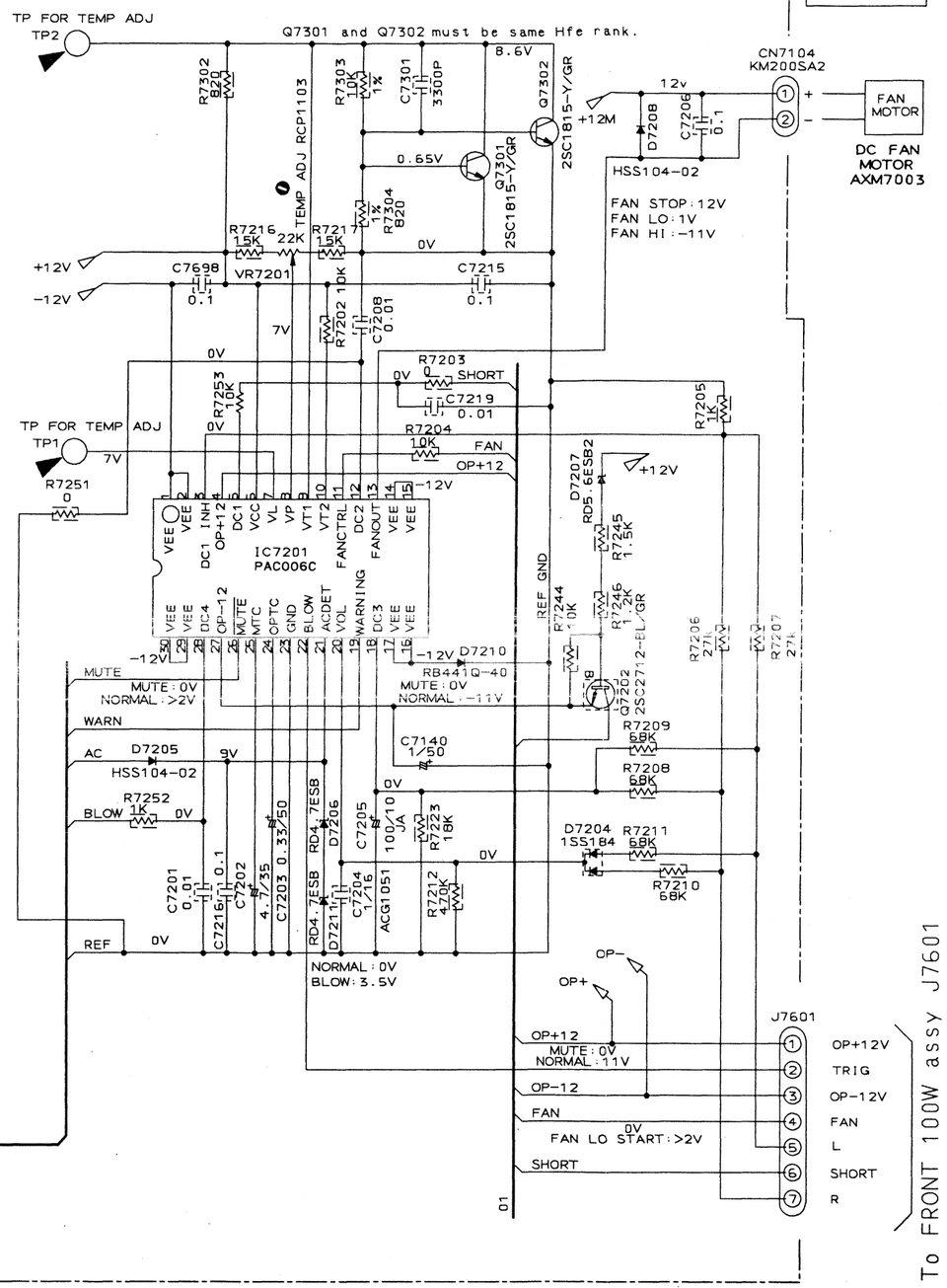
IC7501 (2/2) UPC4570G2(5)

## 4.4 REGULATOR ASSEMBLY

REGULATOR assy (AWZ7726)

SCH-4



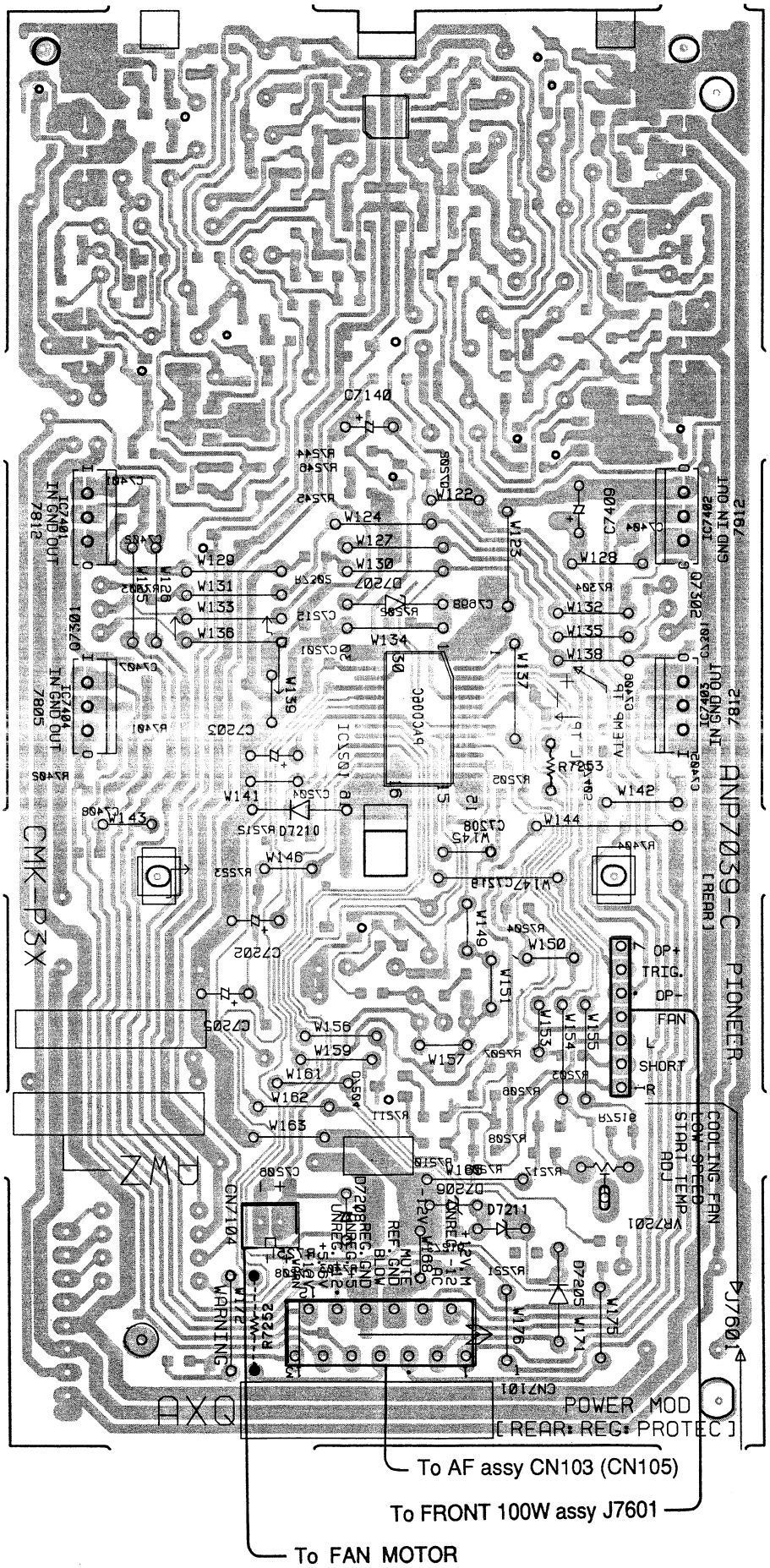

REGULATOR ASSY SCH-4

REGULATOR ASSY SCH-4

● This diagram is viewed from the mounted parts side.

REGULATOR ASSY

PCB-3



● This diagram is viewed from the foil side.

PCB-3

REGULATOR ASSY

To AF assy CN103 (CN105)

To FRONT 100W assy J7601

To FAN MOTOR

# 5. PCB PARTS LIST

*NOTES:*

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

*Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

| | | | | |
|---|---|---|---|---|
| *560Ω* | → | *56×10¹* → *561* | ····· | *RD1/8PM 5 6 1 J* |
| *47kΩ* | → | *47×10³* → *473* | ····· | *RD1/4PS 4 7 3 J* |
| *0.5Ω* | → | *0R5* | ····· | *RN2H 0 R 5 K* |
| *1Ω* | → | *010* | ····· | *RS1P 0 1 0 K* |

*Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).*

| | | | | |
|---|---|---|---|---|
| *5.62kΩ* | → | *562×10¹* → *5621* | ····· | *RN1/4PC 5 6 2 1 F* |

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| **LIST OF ASSEMBLIES** | | | |
| | AF ASSY | | AWK7166 |
| | ├ AF ASSY | | AWZ7584 |
| NSP | ├ TRANS ASSY | | AWZ7585 |
| NSP | ├ HEAD PHONE ASSY | | AWZ7586 |
| NSP | ├ SP TERMINAL ASSY | | AWZ7587 |
| NSP | └ INDICATOR ASSY | | AWZ7588 |
| | POWER AMP MODULE | | AXQ7022 |
| | ├ FRONT 100W ASSY | | AWZ7725 |
| | └ REGURATOR ASSY | | AWZ7726 |
| **AF ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| | IC101 | | TLP560G |
| | Q113 | | 2SA1048 |
| | Q114,Q115 | | 2SA1515 |
| | Q191 | | 2SA965 |
| | Q125,Q134,Q135 | | 2SC1845 |
| | Q112,Q118,Q121,Q122 | | 2SC2458 |
| | Q126−Q133 | | 2SC2458 |
| | Q116 | | 2SC3377 |
| | Q117,Q120,Q123 | | DTA124ES |
| | Q119 | | DTA143ES |
| | D112 | | D2SBA20(B) |
| | D101,D113−D116,D119,D120 | | HSS104−02 |
| | D123,D124 | | HSS104−02 |
| | D111 | | LN6SB60−4003 |
| | D191 | | RD12ESB3 |
| | D121,D122 | | RD7.5ESB2 |
| **SWITCHES AND RELAYS** | | | |
| ⚠ | RY101 | | ASR1027 |
| ⚠ | RY102 | | ASR7005 |
| **CAPACITORS** | | | |
| ⚠ | C101,C102,C104,C105 | | ACG1054 |
| | C121,C122 (4700,63V) | | ACH1249 |
| | C129 | | CEAS010M50 |
| | C125,C126 | | CEAS100M50 |
| | C128 | | CEAS101M25 |
| | C131 | | CEAS221M10 |
| | C123 | | CEAS222M35 |
| | C124 | | CEAS471M35 |
| | C130,C191 | | CEAS4R7M50 |
| ⚠ | C111,C112 | | CQMA103K25O |
| | C141−C144 | | CQMA104J50 |
| | C113−C116 | | CQMA223K25O |
| **RESISTORS** | | | |
| ⚠ | R101 | (2.2M,1/2W) | ACN−208 |
| | R183,R184 | | RD1/2PM7R5J |
| ⚠ | R102 | | RD1/4PM101J |
| | R133,R134 | | RD1/4PM271J |
| | R111,R112 | | RS3LMF152J |
| | R155−R158 | | RS3LMFR22J |
| | | Other Resistors | RD1/8PM□□□J |
| **OTHERS** | | | |
| | Y2003 | BOARDIN READ WIRE | ADX7043 |
| | Y2004 | BOARDIN READ WIRE | ADX7044 |
| | | SPEAKER TERMINAL 8−P | AKE−111 |
| | | AC OUTLET 3P | AKP1053 |
| | | SOCKET(19P) | AKP7001 |
| ⚠ | H101−H106 | FUSE CLIP | AKR1003 |
| | | CABLE HOLDER | AKT1011 |
| | CN102,CN104 | 10P SOCKET | KP250NA10 |
| **TRANS ASSY** | | | |
| | | This assembly has no service part. | |
| **HEAD PHONE ASSY** | | | |
| **SWITCHES AND RELAYS** | | | |
| | S271 | | SULLXS |
| **CAPACITORS** | | | |
| | C271 | | CKCYF473Z50 |
| **RESISTORS** | | | |
| | R271,R272 | | RS3LMF331J |
| **OTHERS** | | | |
| | CN272 | JACK | AKN1025 |

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| **SP TERMINAL ASSY** | | | |
| **CAPACITORS** | | | |
| | C251－C254 | | CQMA104J50 |
| **RESISTORS** | | | |
| | R253,R254 | | RD1/2PM7R5J |
| **OTHERS** | | | |
| | | SPEAKER TERMINAL 4－P | AKE1012 |
| | CN252 | SPEAKER TERMINAL 2－P | AKE1032 |
| **INDICATOR ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| | D201－D206 | | AEL1065 |
| **FRONT 100W ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| | IC7501 | | UPC4570G2(5) |
| | Q7507,Q7508 | | 2SA1182 |
| | Q7601 | | 2SA1255 |
| | Q7501,Q7502 | | 2SC2240 |
| | Q7505,Q7506 | | 2SC2859 |
| | Q7602,Q7603 | | 2SC3138 |
| | D7505,D7506,D7517,D7518 | | 1SS181 |
| | D7503,D7504,D7516 | | 1SS184 |
| | D7535－D7538 | | 1SS226 |
| | D7521－D7524 | | 1SS244 |
| | D7519,D7520,D7525,D7526,D7531 | | HSS104－02 |
| | D7533 | | HSS104－02 |
| | D7507－D7510 | | RD3.3ESB2 |
| **CAPACITORS** | | | |
| | C7519－C7522,C7545－C7552 | | CCSQCH101J50 |
| | C7525－C7528 | | CCSQCH271J50 |
| | C7503,C7504 | | CCSQCH331J50 |
| | C7541,C7542 | | CCSQCH470J50 |
| | C7523,C7524 | | CEALR10M50 |
| | C7509,C7510 | | CEAS101M10 |
| | C7602 | | CEJA221M6R3 |
| | C7540 | | CEJA3R3M50 |
| | C7539 | | CEJA4R7M50 |
| | C7699 | | CKSQYB104K25 |
| | C7529－C7532 | | CKSQYB333K50 |
| | C7543,C7544 | | CKSQYB472K50 |
| | C7601,C7603 | | CKSQYF104Z50 |
| | C7537 | | CKSQYF473Z50 |
| **RESISTORS** | | | |
| | R7519,R7520 | | ACN1106 |
| | R7515,R7516 | | ACN1107 |
| ⚠ | R7541,R7542 | | RD1/4PMF100J |
| ⚠ | R7547－R7550 | | RS1/10S2200F |
| | R7753 | | RS1/8S000J |
| ⚠ | R7537－R7540 | | RS1/8S100J |
| | R7553 | | RS1/8S101J |
| ⚠ | R7543,R7544 | | RS1/8S7R5J |
| | | Other Resistors | RS1/10S□□□J |

| Mark | No. | Description | Parts No. |
|---|---|---|---|
| **OTHERS** | | | |
| | CN7502 | ·10P PLUG | KM250NA10L |
| **REGURATOR ASSY** | | | |
| **SEMICONDUCTORS** | | | |
| | IC7201 | | PAC006C |
| | Q7301,Q7302 | | 2SC1815 |
| | Q7202 | | 2SC2712 |
| | D7204 | | 1SS184 |
| | D7205,D7208 | | HSS104－02 |
| | D7210 | | RB441Q－40 |
| | D7206,D7211 | | RD4.7ESB |
| | D7207 | | RD5.6ESB2 |
| **CAPACITORS** | | | |
| | C7402,C7406,C7408 | | ACG1050 |
| | C7204 | | ACG1051 |
| | C7401,C7405,C7407 | | ACG1053 |
| | C7409 | | ACH1150 |
| | C7202 | (4.7U,DC35V) | ACH7008 |
| | C7203 | (0.33U,DC50V) | ACH7009 |
| | C7140 | | CEAS010M50 |
| | C7205 | | CEJA101M10 |
| | C7697 | | CKDYB103K50 |
| | C7201,C7208,C7219 | | CKSQYB103K50 |
| | C7301 | | CKSQYB332K50 |
| | C7206,C7215,C7216,C7404,C7698 | | CKSQYF104Z50 |
| **RESISTORS** | | | |
| ⚠ | R7403－R7405 | | ACN1104 |
| | R7252 | | RD1/6PM102J |
| | R7253 | | RD1/6PM103J |
| | R7303 | | RS1/10S1002F |
| | R7304 | | RS1/10S8200F |
| | VR7201 | (22K,0.1W) | RCP1103 |
| | | Other Resistors | RS1/10S□□□J |
| **OTHERS** | | | |
| | CN7101 | CONNECTOR(13P) | KPE13 |

# 6. ADJUSTMENTS

## ■ POWER AMP MODULE SECTION (Refer to Fig. 6−1.)

### 1. Handling Precautions

- Since the heat sink and transistor metallic parts are connected to the Front Amp output, make sure they do not contact the GND (chassis) or other circuits.
- Since there is residual high voltage in the Power Amp Module ±B1 (FRONT 100W ASSY) and ±B2 (REGULATOR ASSY) even when the power is OFF, caution should be exercised. (If necessary, the voltage should be discharged).
- When handling the Power Amp Module, make sure you do not touch the fan motor blade.

### 2. Adjustment and Confirmation of Idle Current

- Basically, the idle current needs to be confirmed when replacing a power transistor, driver transistor, or bias transistor, or when the entire split board Assy of the Power Amp Module has been replaced.
- Make sure the heat sink has cooled sufficiently before measuring the idle current. (Temperature should be the same as room temperature; 25°C is ideal, if possible.)
- Idle current stipulated value: 3−100mA.

■ Front Amp Side (FRONT 100W ASSY)

| Step | Measurement | Item | Remarks |
|---|---|---|---|
| 1 | Lch side | Insert a resistor (0.22Ω, 3W or more) in series in the connector CN7502 +B1 (or −B1) line (terminal No. 5 or 6). (Refer to Fig. 6−2.) | For measuring voltage at both sides of resistor |
| 2 | | Short both sides of C7524. | Do not operate Rch side. |
| 3 | | Turn the power ON, wait 6 seconds, and then measure the resistance voltage in Step 1. | Lch Idle current I=V/0.22 (Ω) |
| 4 | Rch side | • Same as Step 1 above.<br>• Short both sides of C7523. | Do not operate Lch side. |
| 5 | | Turn the power ON under the above conditions, and after 6 seconds measure the resistance voltage in Step 1. | |
| 6 | —— | If the measured idle current is greater than 100mA, perform the following procedure. | |
| 7 | Lch side | Short between the Point A pattern in Fig. 6−3 using solder. | Connect R7517 to R7515 in a parallel circuit. |
| 8 | Rch side | Short between the Point B pattern in Fig. 6−3 using solder. | Connect R7518 to R7516 in a parallel circuit. |
| 9 | —— | After performing Steps 7 and 8, remeasure the idle current and confirm that it is below 100mA. | |
| 10 | —— | If the measured idle current is below 3mA, perform the following procedure. | |
| 11 | Lch side | Short between the Point C pattern in Fig. 6−3 using solder. | Connect R7551 to R7519 in a parallel circuit. |
| 12 | Rch side | Short between the Point D pattern in Fig. 6−3 using solder. | Connect R7552 to R7520 in a parallel circuit. |
| 13 | —— | After performing Steps 11 and 12, remeasure the idle current and confirm that it is greater than 3mA. (Within 3−100mA) | |

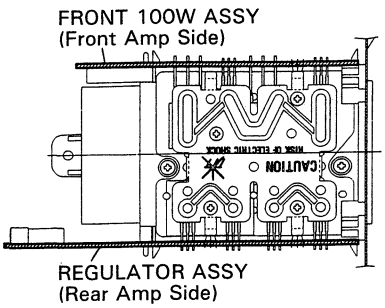



Fig. 6−1 Power Amp Module (POWER MOD. F100)

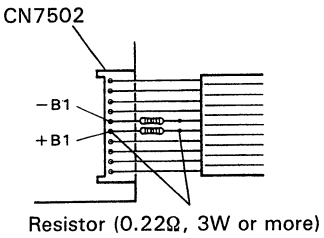



Fig. 6−2 FRONT 100W ASSY

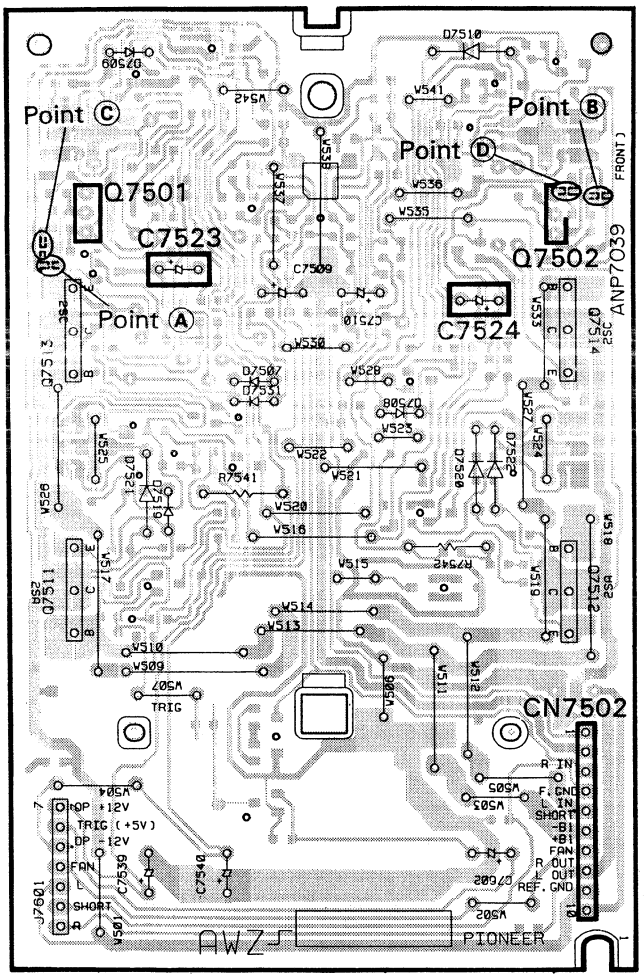



Fig. 6−3 FRONT 100W ASSY

## 3. Adjusting the Operating Temperature Setting of the Fan Motor (VR7201)

This adjustment is necessary when IC7401 (+12V regulator), Q7301 and Q7302 (temperature sensors), IC7201 (protection IC), or VR7201 has been replaced, or when the entire split board Assy of the Power Amp Module has been replaced.

### ■ Adjustment-Related Cautions

- Make sure the heat sink has sufficiently cooled (is the same as room temperature Ta.)
- Once the power has been turned ON, make measurements and adjustments as quickly as possible. (If too much time is taken, the heat sink temperature will rise, and the measurements will deviate from the Ta measurement point.)

### ■ Adjustment

1. Connect a voltmeter between TEMP and VL (or between IC7201 terminals No.9 and 7). (Refer to Fig. 6−4.)
2. Determine the fan motor operating temperature setting by means of the following formula. (Tolerance is within ±30mV.)
   Formula: (75°C − Ta) × 19 (mV)
   Ta: ambient temperature (°C)
3. Adjust VR7201 so that the voltage between TEMP and VL is the value obtained from the above formula.

   For example:
   when the room temperature is 25°C,
   set value = (75 − 25) × 19 (mV)
   = 950mV (tolerance within ±30mV).

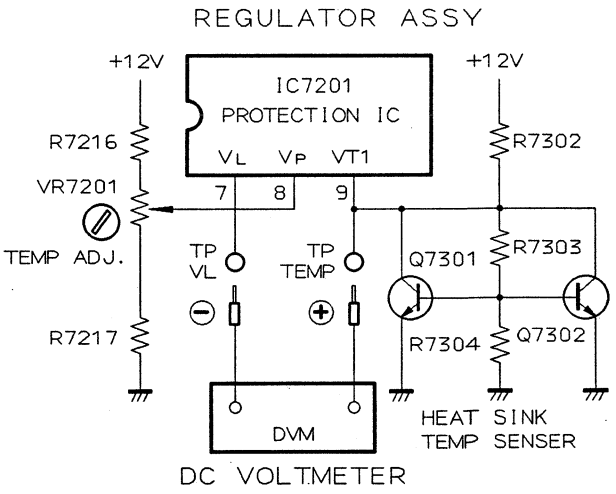



Fig. 6−4 Adjustment of Operating Temperature Setting of Fan Motor

# 7. CIRCUIT DESCRIPTION

## 7.1 HOW TO CHECK M-980

As M−980 is controlled from CX−770S, please carry out check in combination with CX−770S.

**● How to Check M−980 only.**

When checking of the operation of only M−980 is required, the operation can be easily checked according the following procedures.

1. Connect pin 6 (D.GND) and pin 9 (POWER RY) of the CN 107 (external connection connector) on AF ASSY (AWZ 7584).
2. When pressing the power switch of M−980, the set will enter normal operation status. After this, you can carry out check of the operation.

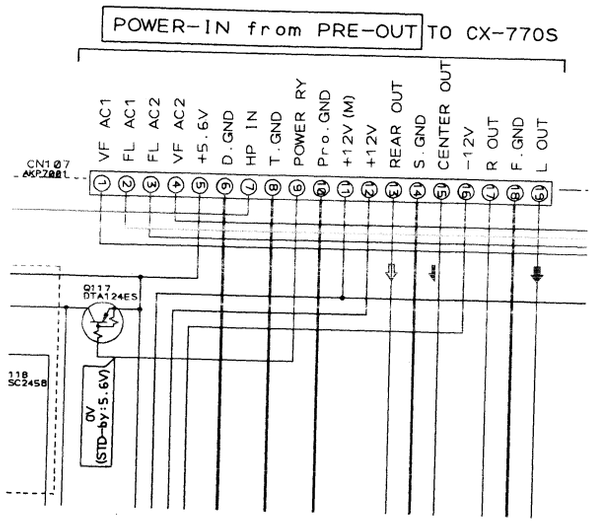



Fig. 1

## 7.2 OPERATION DESCRIPTION OF PROTECTION CIRCUIT

The contact of relay RY102 is usually set to the "b" position, and the transformer is put into the current conduction state via path ①.

A photo−coupler (IC101) is activated using an LED signal when abnormality occurs (Q125, Q134, and Q135 operate). At that time, the contact of relay RY102 is changed over to the "a" position so as to maintain this state. Therefore, the current conduction to the transformer is cut off because path ② is used. The state of relay RY102 to be maintained is canceled by turning on the power switch (S101) again.

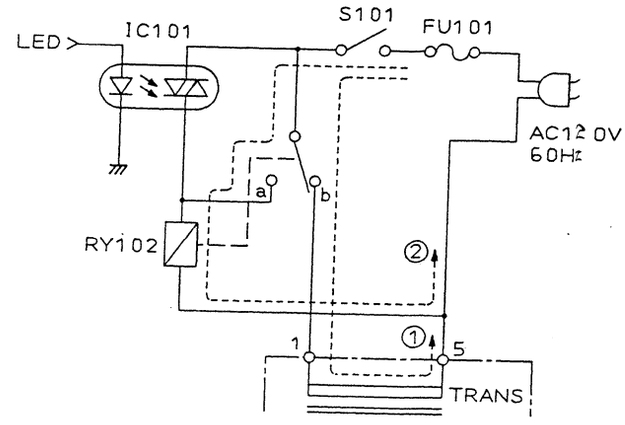



Fig. 2

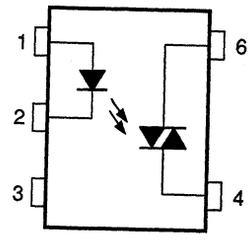
# 8. IC INFORMATION

● The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

## ■ TLP560G (IC101 : AF ASSY)

## ● PHOTO COUPLER

**● Pin Assignment (Top view)**




**● Pin Name**

1 : Anode
2 : Cathode
3 : Not connected
4 : Triode AC switch pin
6 : Triode AC switch pin

# 9. SPECIFICATIONS

**[Front], [Center], [Rear]**

Continuous Power Output

Stereo (Front Channels) ..... Continuous Average Power Output is 100 Watts* per channel, min., at 8 ohms from 70 Hertz to 20,000 Hertz, with no more than 0.9 %** total harmonic distortion.

4-Channel

Front Channels ..... 150 W + 150 W (8 Ω , 1 kHz, 10 % THD)

Center Channel ..... 150 W (8 Ω , 1 kHz, 10 % THD)

Rear Channels ..... 150 W (8 Ω , 1 kHz, 10 % THD)

Input (Sensitivity/Impedance)

PHONO (MM) ..... 5 mV/47 kΩ

CD, VIDEO ..... 200 mV/22 kΩ

Signal-to-Noise Ratio (IHF, short-circuited, A network)

PHONO (MM) ..... 65 dB

CD, VIDEO ..... 80 dB

Graphic Equalizer Frequency Band

..... 60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4 kHz, 6 kHz, 15 kHz, ±10 dB

* *Measured pursuant to the Federal Trade Commission's Trade Regulation rules on Power Output Claims for Amplifiers.*

* * *Measured By Audio Spectrum Analyzer.*

**Miscellaneous**

Power Requirements ..... AC 120 V, 60 Hz

Power Consumption

M-980 ..... 390 W, 500 VA

AC Outlets

Switched x 1 ..... 100 W (0.8 A) MAX

Unswitched x 2 ..... 200 W (1.6 A) MAX

Dimensions

M-980 ..... 420 (W) x 140 (H) x 336 (D) mm
16-9/16 (W) x 5-1/2 (H) x 13-1/4 (D) in

Weight (without package)

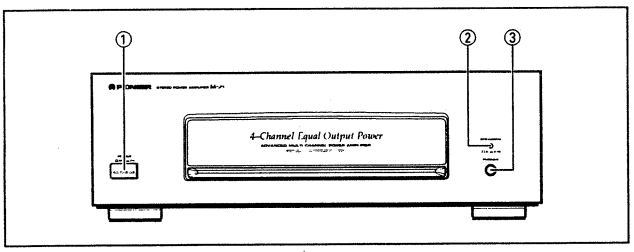
M-980 ..... 8.9 kg (19 lb 10 oz)

***NOTE:***

- *Specifications and design are subject to possible modifications without notice due to improvements.*

# 10. PANEL FACILITIES

## ■ POWER AMPLIFIER SECTION




### ① POWER (OFF/ON) switch

When this switch is OFF, the tuner control amplifier's POWER switch does not function. When this switch is ON, the STANDBY indicator of the tuner control amplifier lights.

### ② SPEAKERS button (▮ A, ▬ A+B)

This is used to select the speaker through which you wish to listen.

▮ **A** : When the speakers connected to A terminals are in use.

▬ **A+B** : When the speakers connected to A and B terminals are in use.
(There is no sound at this position when speakers are connected only to the A terminals.)

Be sure to use A terminals when you are using one pair of speakers only. No sound will be heard through the speakers when only one pair of speakers are connected to B terminals.

### ③ PHONES jack

This is a "standard plug-type jack" for headphones.

***NOTE:***

*Sound is not heard from the speakers when headphones are in use.*